

ANALYSIS PROTO-FEDERATION DEVELOPMENT

Briefing to:
The DMSO High Level Architecture
Architecture Management Group
3/6/96

The Analysis Proto-Federation

JWARS

Development Process

The FOM for the Analysis Proto-Federation is a Conceptual Partitioning of the Simulation Space Between JWARS and MIDAS for the HLA RTI Testing.

This Conceptual Partitioning Serves as the Basis For Partitioning the Actual Developmental Effort for the Two Models.

The Partitioning was Hosted by the JWARS Office in Coordination with OSD, ODPA&E to Guide the Planning of the Object-Oriented JWARS and MIDAS Developmental Effort

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Development Process

The FOM Preceded the SOMs for the Two Models, JWARS and MIDAS. Once the Initial Partitioning was Accomplished, the SOMs for the Two Models Were Developed.

The FOM was Developed in Paradigm+ Using the Rumbaugh Object Modeling Technique.

The FOM Tables were Developed in Microsoft Excel.

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Development Process

1. A Scenario and Use Case Development Was Undertaken to Provide Context For The Mission Space Partitioning.
2. The FOM Conceptual Model was Built From a Partitioning of the Mission Space.
3. The FOM Object Model was Built From the FOM Conceptual Model.
4. The Interactions of Interest were Defined.
5. The FOM Tables were Constructed.

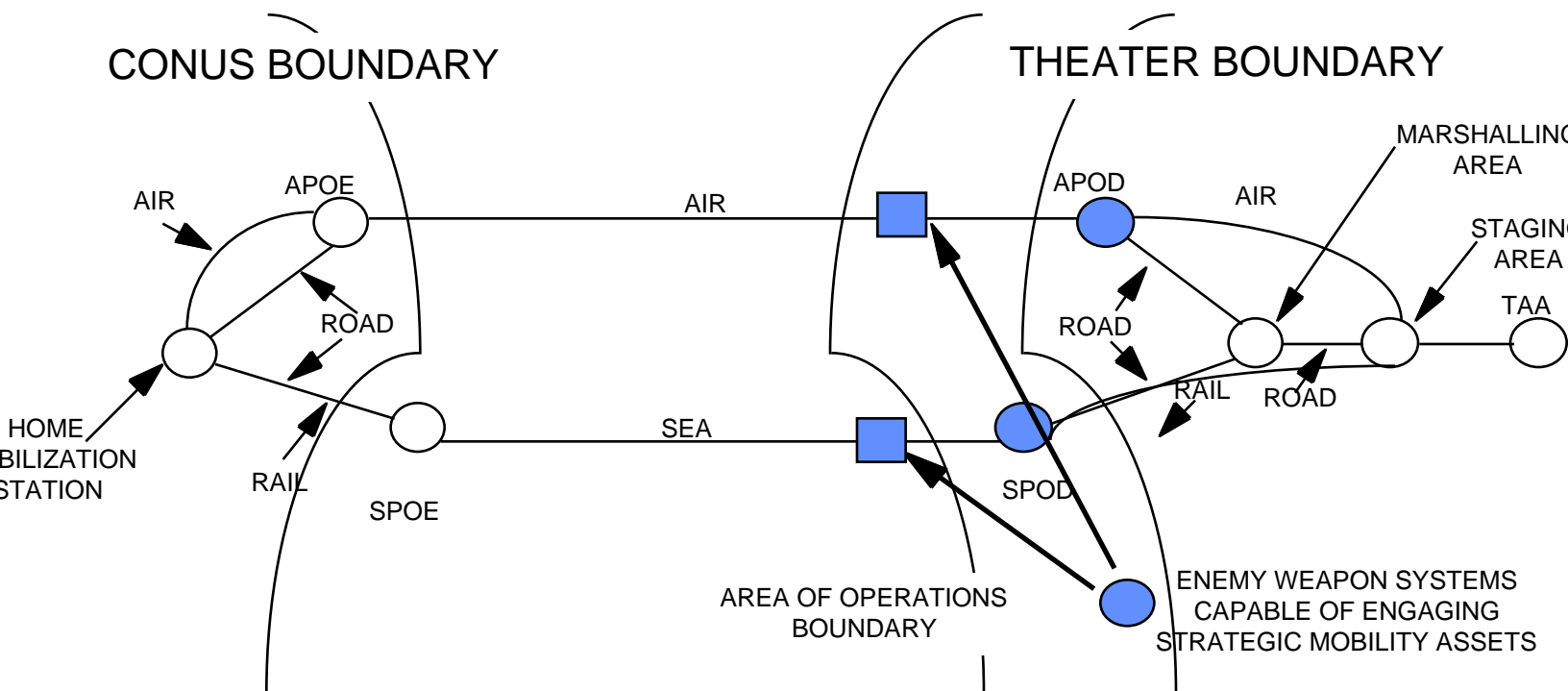
ANALYSIS PROTO-FEDERATION MISSION SPACE

JWARS

		JWARS1	JWARS2	MIDAS
1	ISR	X	X	
2	C4I	X	X	
3	FIREPOWER	X	X	
4	MOBILITY	X	X	X
5	LOGISTICS	X	X	X

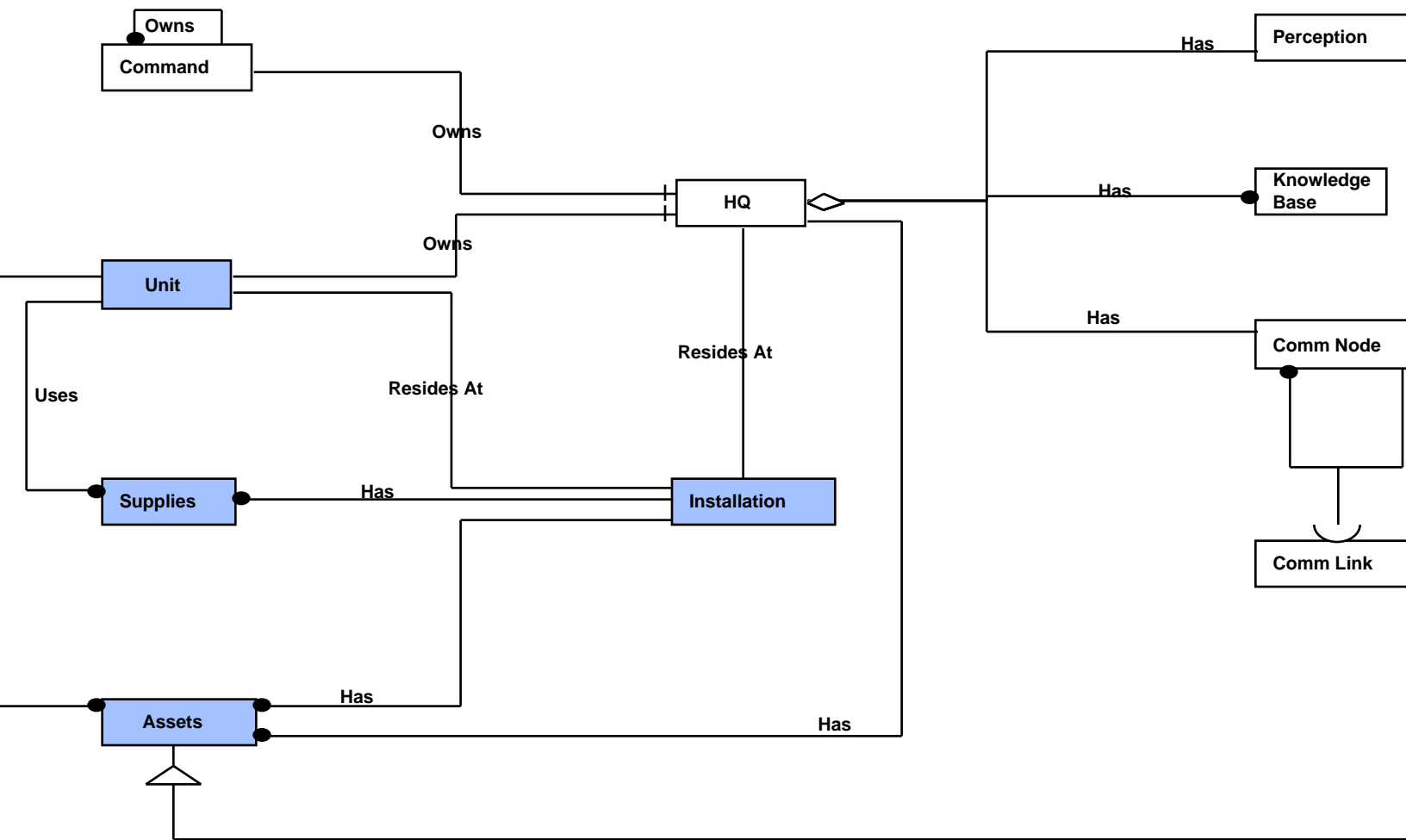
ANALYSIS PROTO-FEDERATION MISSION SPACE

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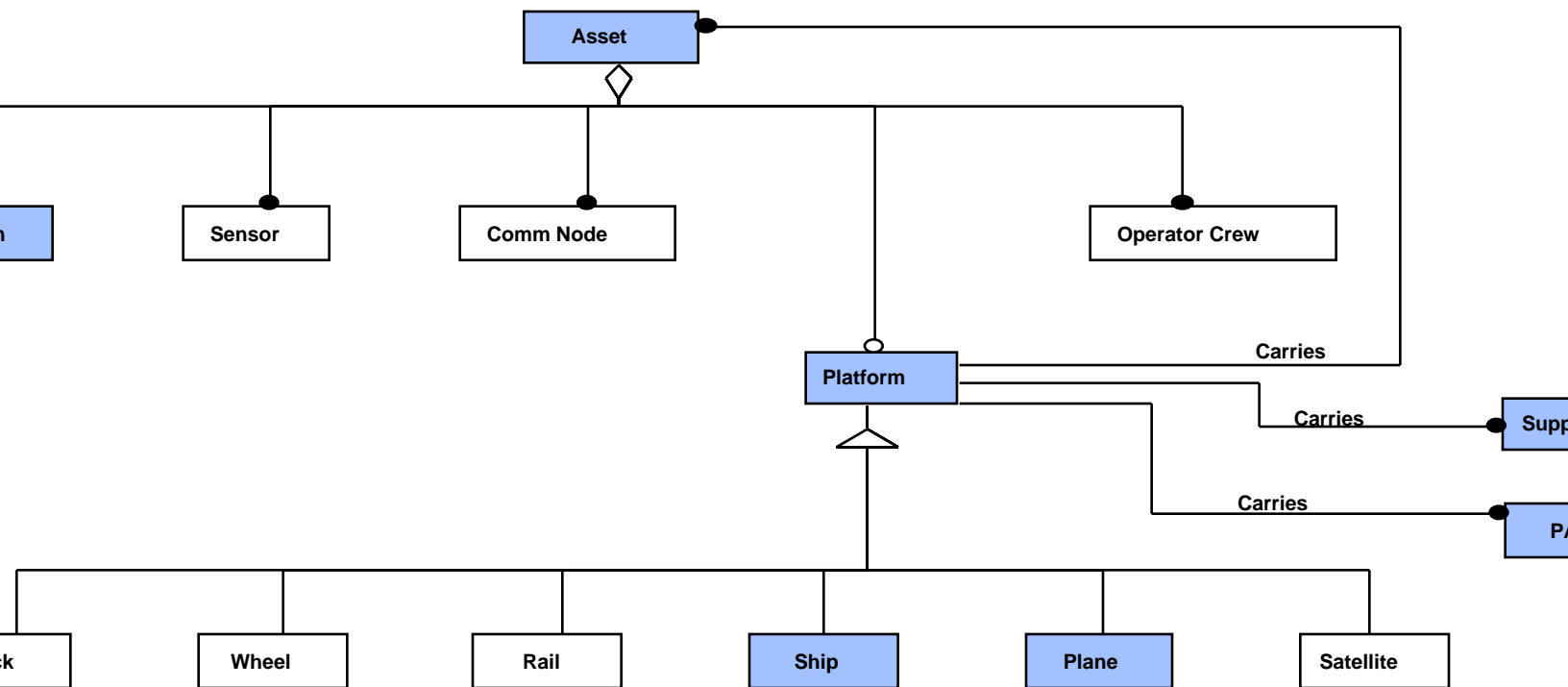
Command and Control Object Model

ARS



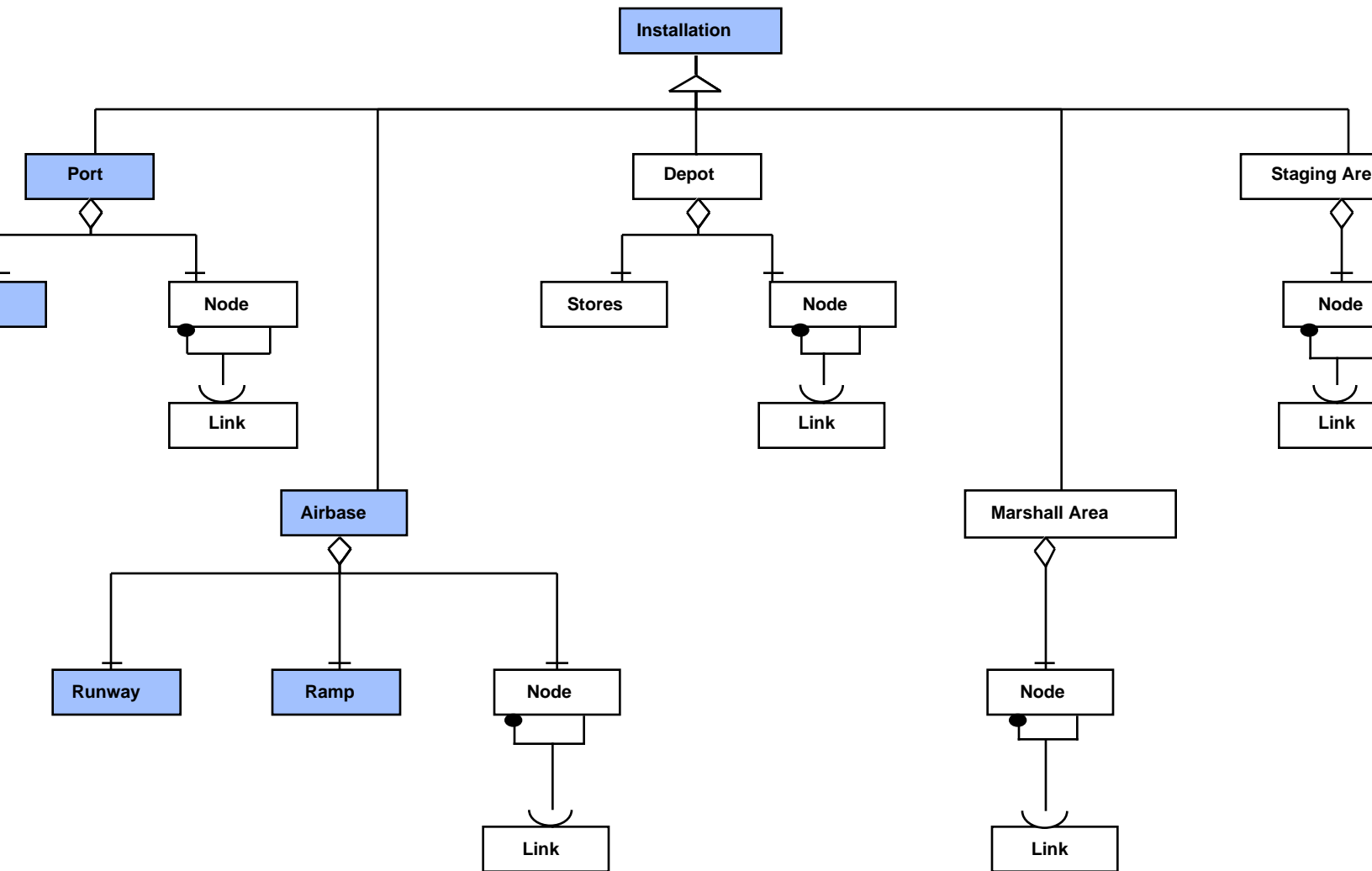
Asset / Platform Object Model

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Installation Object Model

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Lessons Learned

1. For Us, It Is Too Early to Discuss Lessons Learned.
2. Our Process Is the Opposite Case of the Other Federations. We Had No Legacy Models to Federate.
3. The Process We Went Through Has Served Us Well So Far.

Backup Slides

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JWARS

The JWARS Prototype

GRC International, Mr. Denis Clements

The Alternate JWARS Prototype

Los Alamos National Laboratory, Mr. Ray Gordon

The MIDAS Prototype

GRC International, Mr. Emmet Beeker

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JWARS

The JWARS Prototype

In Development

Testing to Begin April, 1996

The Alternate JWARS Prototype

In Development

Testing to Begin April, 1996

The MIDAS Prototype

In Development

Testing has Begun

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I Testing Lessons Learned

Permissions Issues:

ok - Loading versus Launching

Testing (One -Sided):

ok - RTI - Test_Federate, Same Machine

RTI - MIDAS Federate, Same Machine

RTI - MIDAS Federate, Different Machine

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RTI Testing Lessons Learned

Permissions Issues:

Load Orbix as ROOT

Load RTI as ROOT

Launch Orbix as USERID1

Launch RTI as USERID1

Works

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RTI Testing Lessons Learned

Permissions Issues:

Load Orbix as ROOT

Load RTI as ROOT

Launch Orbix as ROOT

Launch RTI as USERID1

Does Not Work

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JWARS

Status of FOM Development

- The draft FOM has been developed.
- The FOM will be finalized as JWARS Use-Case 3 is developed, estimated completion is 4/96.
- No changes are recommended for the Object Model Templates at this time.

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Experience with RTI v0.1

- The RTI is installed.
- No problems were encountered during installation.
- Testing has begun.
- There are no results to report at this time.

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Status of Federate Development

- JWARS1 (GRCI) is under development.
- JWARS2 (LANL) is under development.
- MIDAS (GRCI) is under development.
- RTI integrated testing has begun.
- Federation testing will begin 4/96.

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JARS

Status of Federate Development

Federation testing depends on the development of JARS Use-Case 3.

Use-Case 1 (C4I/ISR)

Development began 10/95.

Use-Case 2 (C4I/ISR/Firepower)

Development began this month.

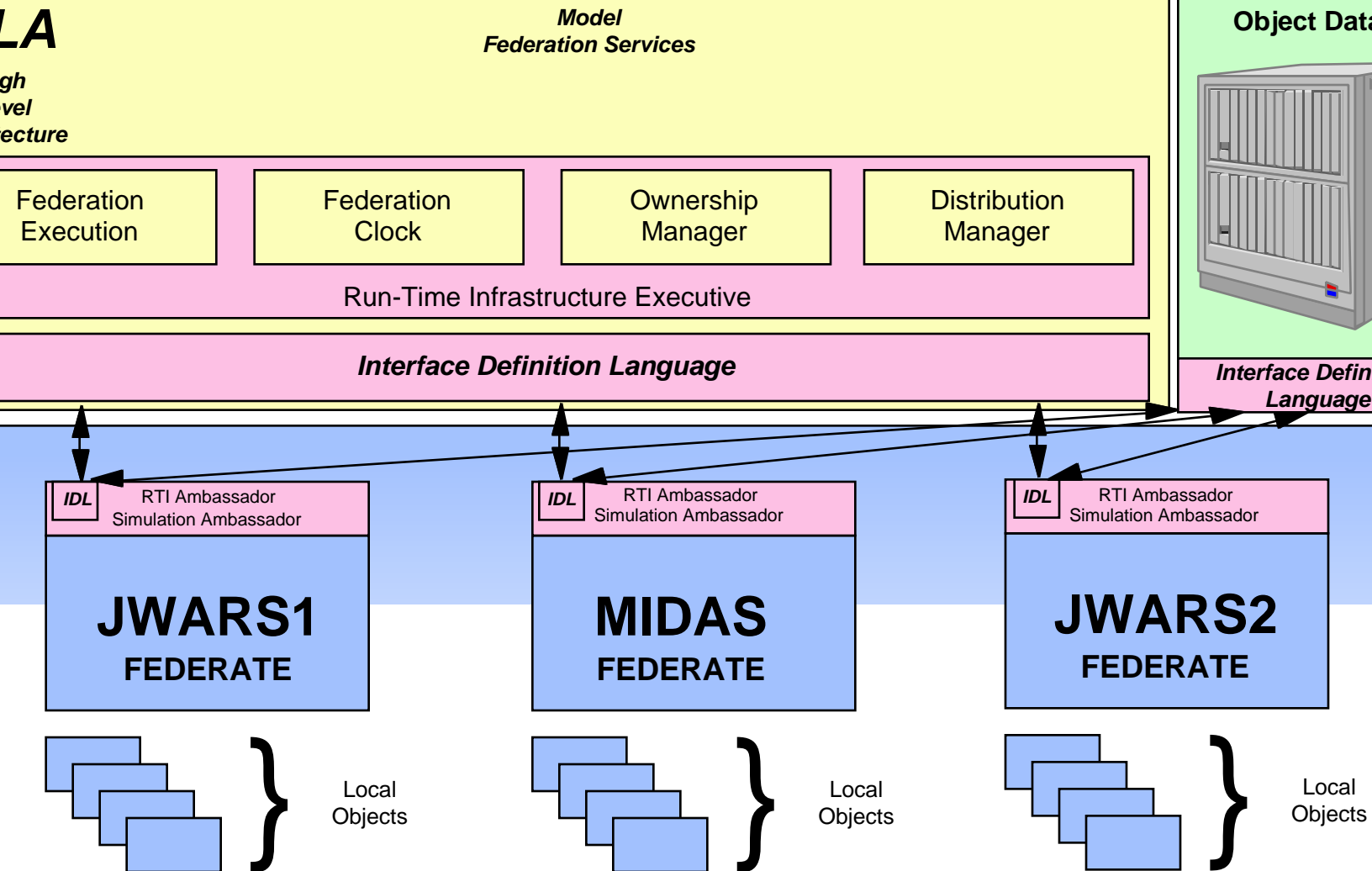
Use-Case 3 (C4I/ISR/Firepower/Deployment)

Development will begin 2/96. The development of Use-Case 3 will be sufficient for federation testing to begin by 4/96.

ANALYSIS PROTO-FEDERATION ARCHITECTURE

ALTERNATIVE 1

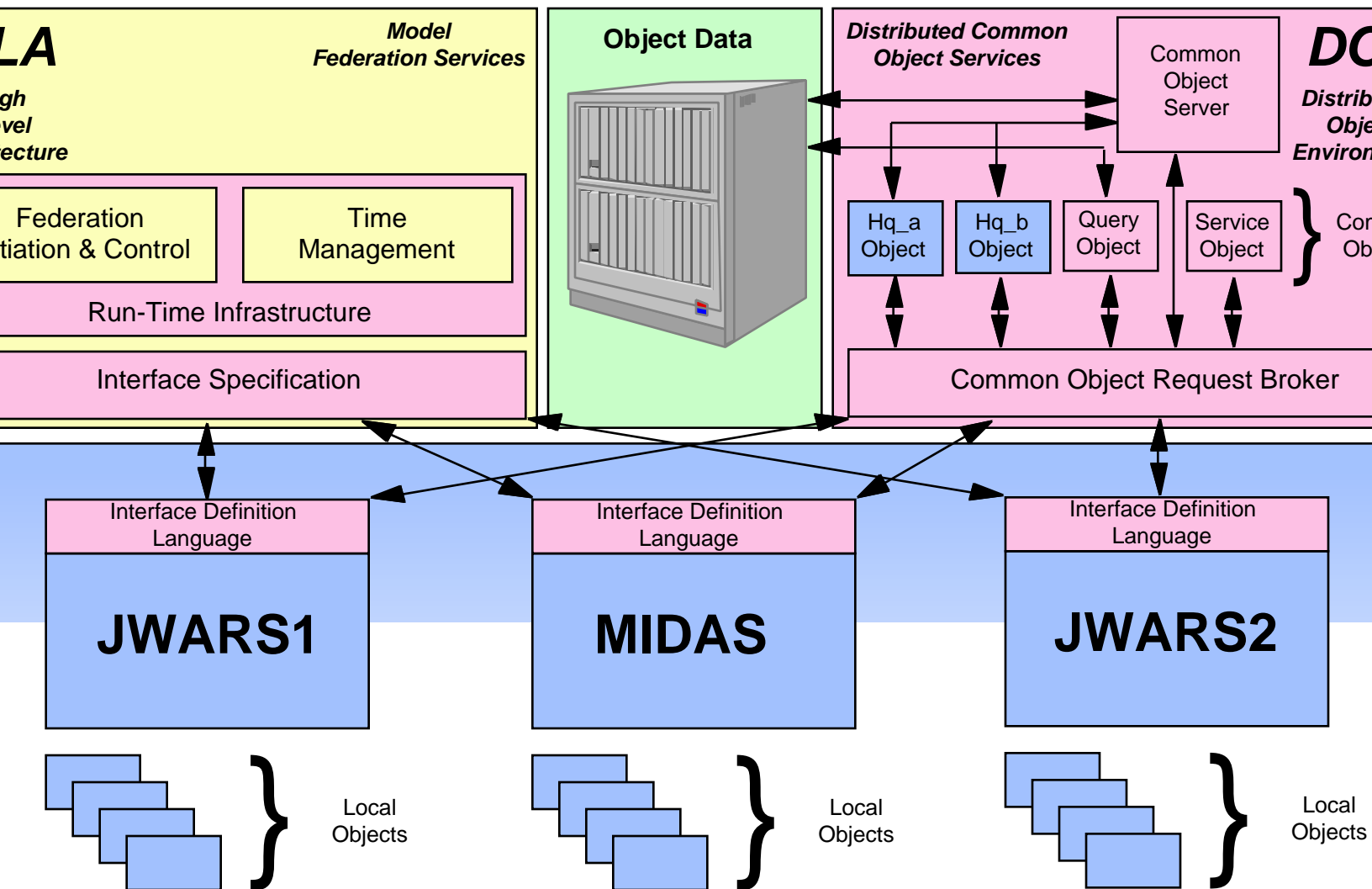
JARS



ANALYSIS PROTO- FEDERATION ARCHITECTURE

ALTERNATIVE 2

JWARS



ANALYSIS PROTO-FEDERATION SERVICE

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- Federation Initiation and Control
- Federation Object Declaration Services
 - Publish, Subscribe, Update
- Federation Object Management Services
 - Instantiate, Delete, Update Values
- Federation Object Ownership Management
 - Acquisition, Divestiture
- Time Management

Planning For HLA Critical Issues

JWARS

- HLA Critical Issues Part Of JWARS Development Planning
- JWARS Team Members Briefed On Critical Issues
- Regular Reviews Of JWARS Experience Related To Issues
- Reporting On Issues To AMG Working Groups
- Reporting On HLA Issues As Part Of Project Deliverables

Issue Resolution Methodology

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<i>Issue</i>	<i>Method For Issue Resolution</i>			
	Analysis	DI	Test	WG
Issue 1: Single HLA interface specification				✓
Issue 2: Support non-simulation objects		✓	✓	✓
Issue 3: RTI technical feasibility		✓	✓	✓
Issue 4: RTI reusability			✓	✓
Issue 5: RTI portability	✓			✓
Issue 6: RTI variations	✓			✓
Issue 7: Impact of HLA rules		✓		✓
Issue 8: Object Model Template usability		✓		✓
Issue 9: Object model use over federation life	✓			✓
Issue 10: Representation of object models	✓	✓	✓	✓
Issue 11: Testing HLA technical compliance		✓		✓
Issue 12: Testing FOM compliance		✓		✓
Issue 13: HLA range of functionality	✓			✓

JWARS SCENARIO

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- Current Status
 - Draft is being staffed
 - Will build on an existing scenario
- Planned Development Steps
 - Use Case 1
 - Use Case 2
 - Use Case 3

JWARS USE CASES

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Use Case 1

- C4I/ISR
- January 1996

Use Case 2

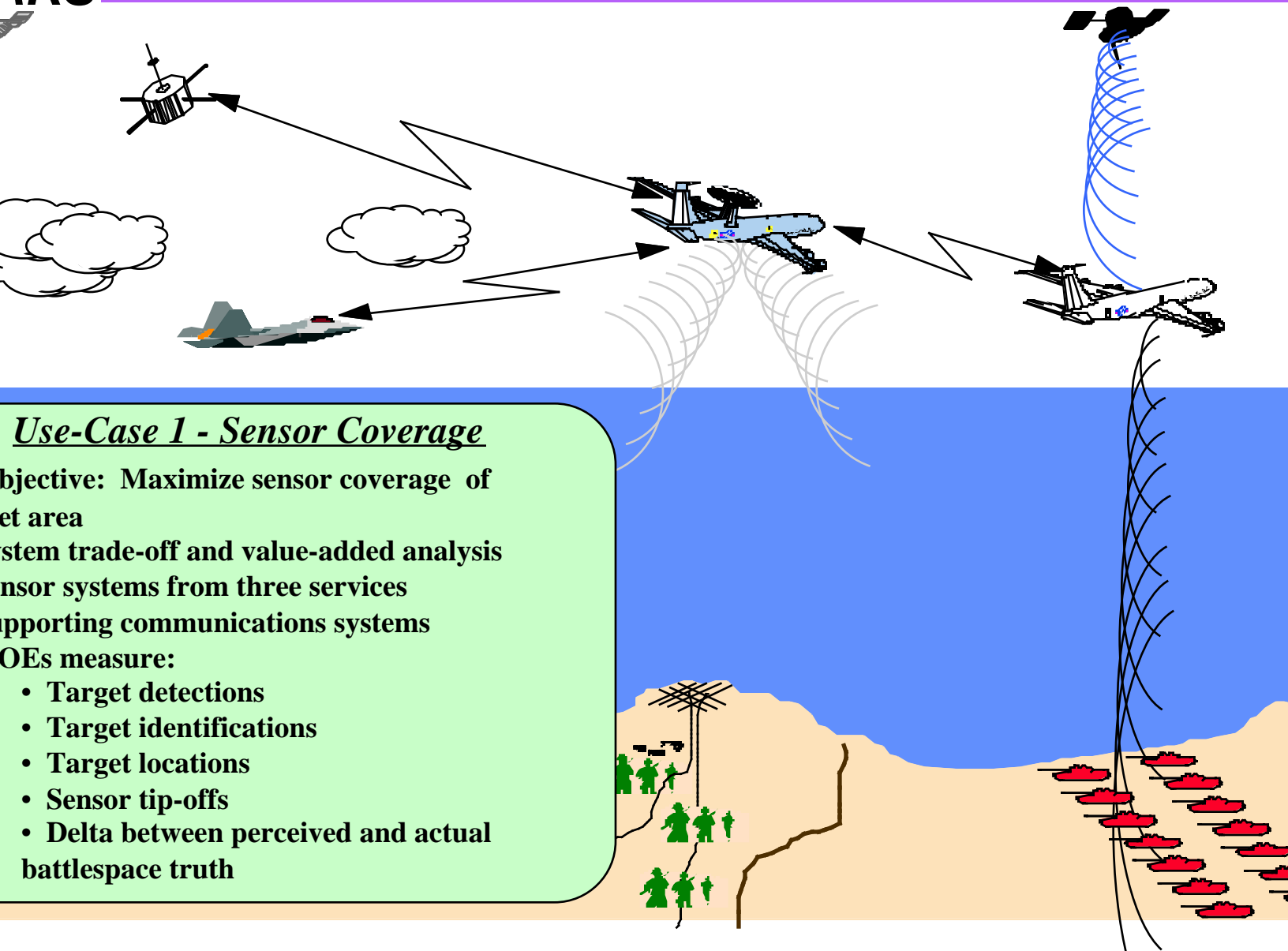
- C4I/ISR/Firepower (HLA Test)
- June 1996

Use Case 3

- C4I/ISR/Firepower/Combat Operations
- September 1996

JWARS USE CASE 1

JWARS



USE CASE 1, TASK LIST

Case	UJTL #	Task Description & Reference
Deployment/Maneuver Tasks		
	ST 1.1.3	Conduct Intratheater Deployment of Forces (JP 3-02, 3-17, 3-18, 4-01)
	OP 1.5.2	Gain and Maintain Maritime Superiority in Theater of Operations/JOA (JP 3-0)
	TA 1.4.2	Occupy Combat Area (JP 1, 3-0)
Intelligence Tasks		
	ST 2.2.1	Collect Information on Strategic Situation, Geography, Medical Risks, Climate, and Significant Hazards (JP 2-0 Series)
	OP 2.2.1	Collect Information on Enemy Operational Situation and Hazards (JP 2-0 Series)
	TA 2.2.1	Collect Information on Situation (JP 2 Series)
	OP 2.2.2	Collect Information on Operational Targets (JP 2-0 Series)
	TA 2.2.2	Collect Target Information (JP 2 Series)
	ST 2.2.3	Provide for Theater Strategic Reconnaissance and Surveillance (JP 2.0)
	OP 2.2.3	Provide Operational Reconnaissance and Surveillance (JP 3-0)
	TA 2.2.3	Provide Tactical Reconnaissance and Surveillance (No Ref.)
	OP 2.3.1	Evaluate Operation Threat (and Friendly) Information (JP 2-0 Series)
	OP 2.3.3	Integrate Operation Intelligence (JP 2-0 Series)
	OP 2.3.3.2	Develop Operational Target Information (JP 2-0 Series)
	TA 2.3.4	Integrate Intelligence Information (JP 2 Series)
	OP 2.4	Produce Operational Intelligence Reports (JP 2-0 Series)
	TA 2.4	Prepare and Disseminate Intelligence Reports (JP 2 Series, 6-04 Series)
	TA 2.4.1	Prepare Intelligence Reports and Estimates (JP 2 Series, 6-04 Series)
	TA 2.4.2	Convey Intelligence (JP 2 Series, 6-04 Series)
	OP 2.5	Disseminate Operational Intelligence Reports (JP 2 Series, 6-04 Series)

USE CASE 1, TASK LIST (cont.)

Firepower Tasks

OP 3.1.4	Prioritize High Payoff Targets (JP 3-56.1)
OP 3.1.5	Publish Tasking Order(s) for Employment of Operational Firepower (JP 3-56)
OP 3.1.6	Conduct Operational Combat Assessment (JP 3-0, 2-01.1)
TA 3.1.3	Develop Order to Fire JP 3-02, 3-05.3, 3-09 Series, 3-52, 3-55)

Command And Control Tasks

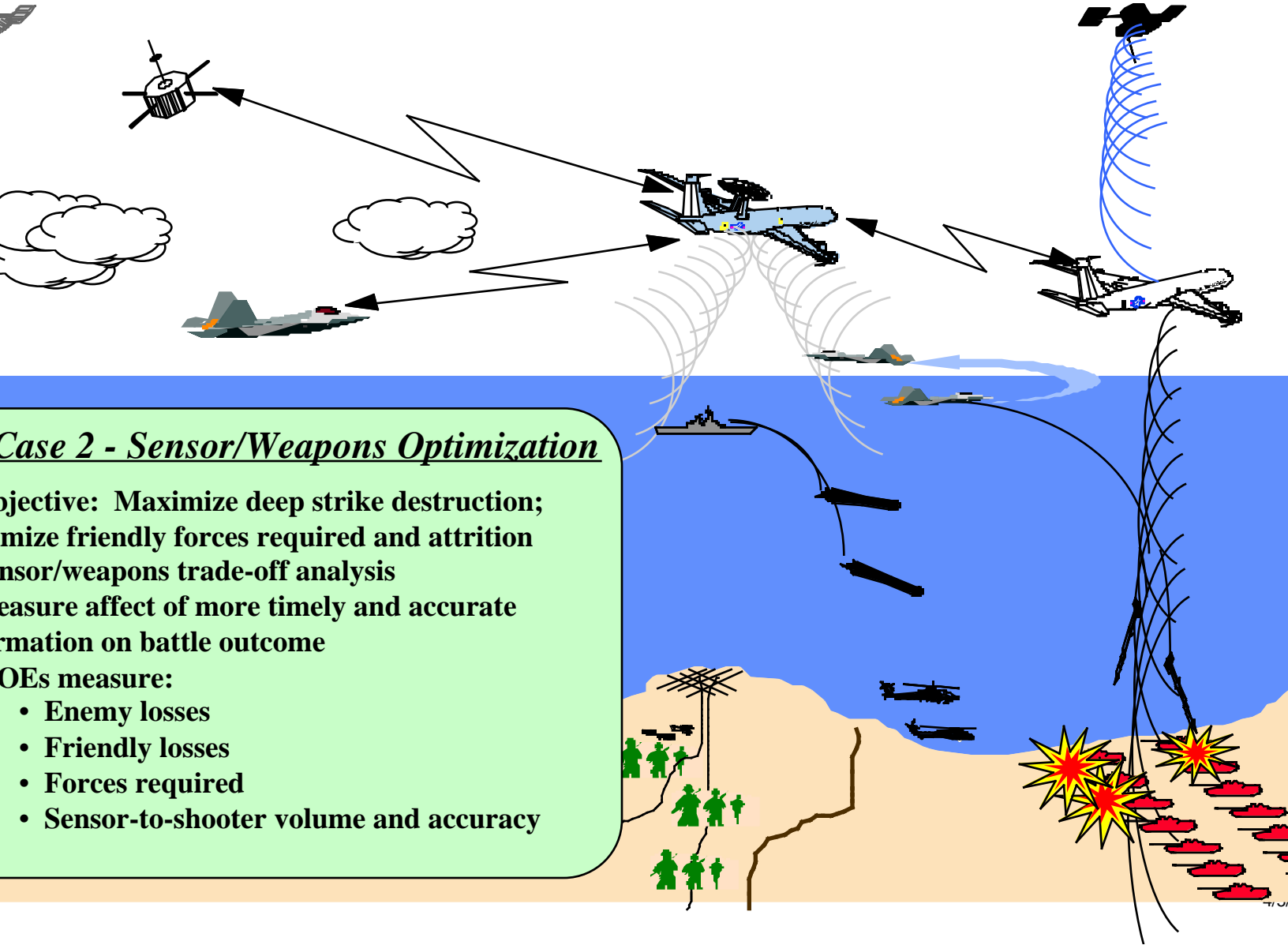
OP 5.1.1	Communicate Operational Information (JP 6-0 Series)
TA 5.1.1	Communicate Information (JP 3-56 Series, 6 Series)
TA 5.2	Assess Situation (JP 0-2, 2-0, 3-0, 3-01.1, 3-10.1, 3-53, 3-55, 5-0, 5-00.2)
TA 5.2.1	Analyze Mission and Current Situation (JP 3-0, 3-05 Series, 3-10.1, 5-0, 5-00.2)
TA 5.3.2	Develop Courses of Action (JP 5-0, 5-00.2, 5-03 Series)
ST 5.4.1	Prepare, Coordinate Theater Strategy, Campaign Plans or Operational Plans and Orders (JP 3-4-0, 5-0, 5-03 Series)
ST 5.4.3	Synchronize Joint Operations and Subordinate Campaign Plans (JP 5-0)
OP 5.4.2	Issue Plans and Orders (JP 3-0, 5-0 Series, 5-03 Series)
OP 5.4.4	Synchronize/Integrate Operations (JP 1, 3-0, 3-03, 3-09)
TA 5.4	Direct and Lead Subordinate Forces (JP 1, 0-2, 3-0, 5-0, 5-00.2, 5-03 Series)
TA 5.4.1	Prepare Plans or Orders (JP 5-0, 5-00.2, 5-03 Series)
TA 5.4.2	Issue Orders JP 5-0, 5-00.2, 5-03 Series)

Operational/Theater Protection Tasks

ST 6.1.4	Provide for Theater Air Defense (JP 3-01.2, 3-01)
ST 6.1.5	Provide for Theater Missile Defense (JP 3-01.5)

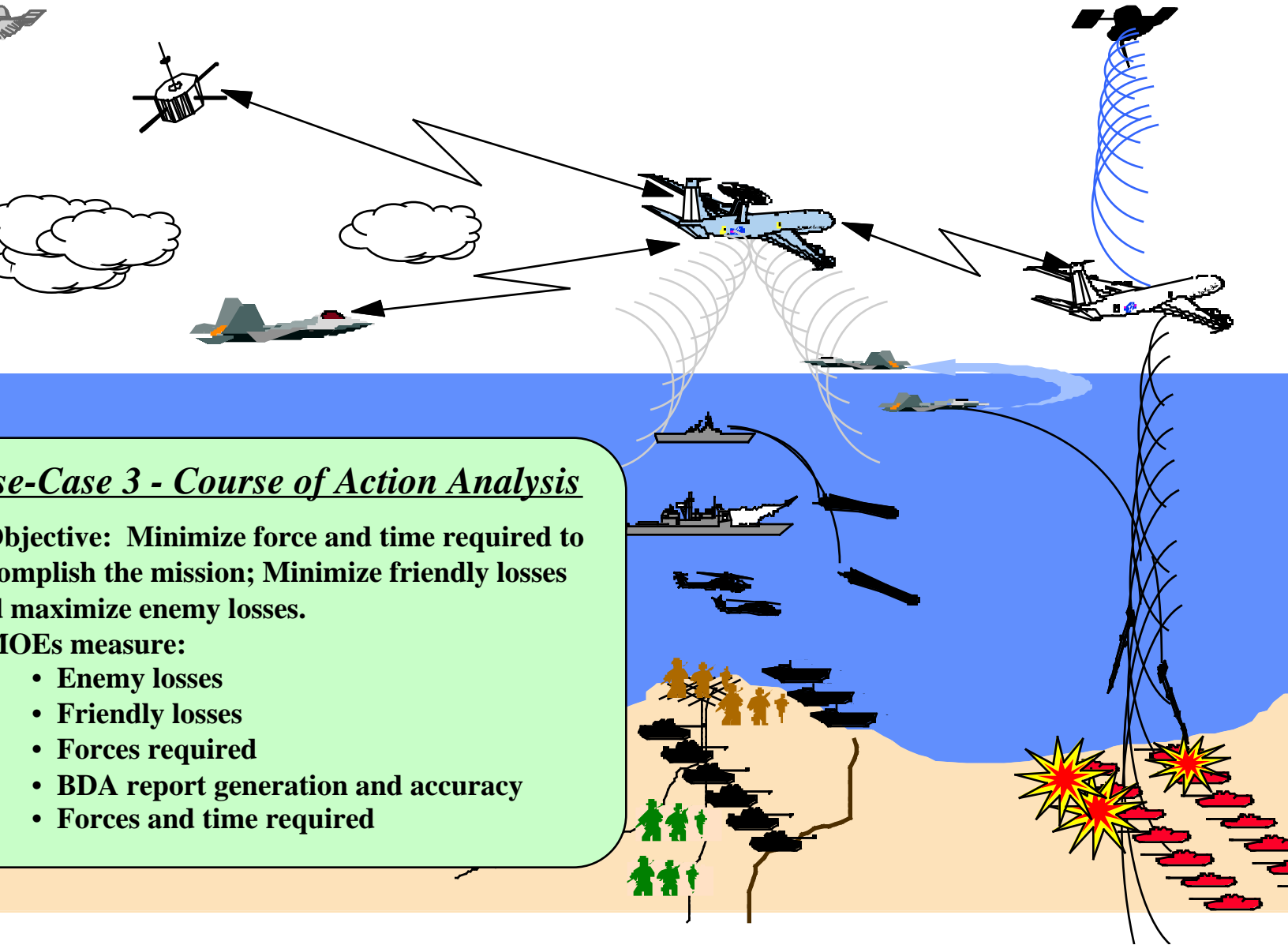
JWARS USE CASE 2

JWARS



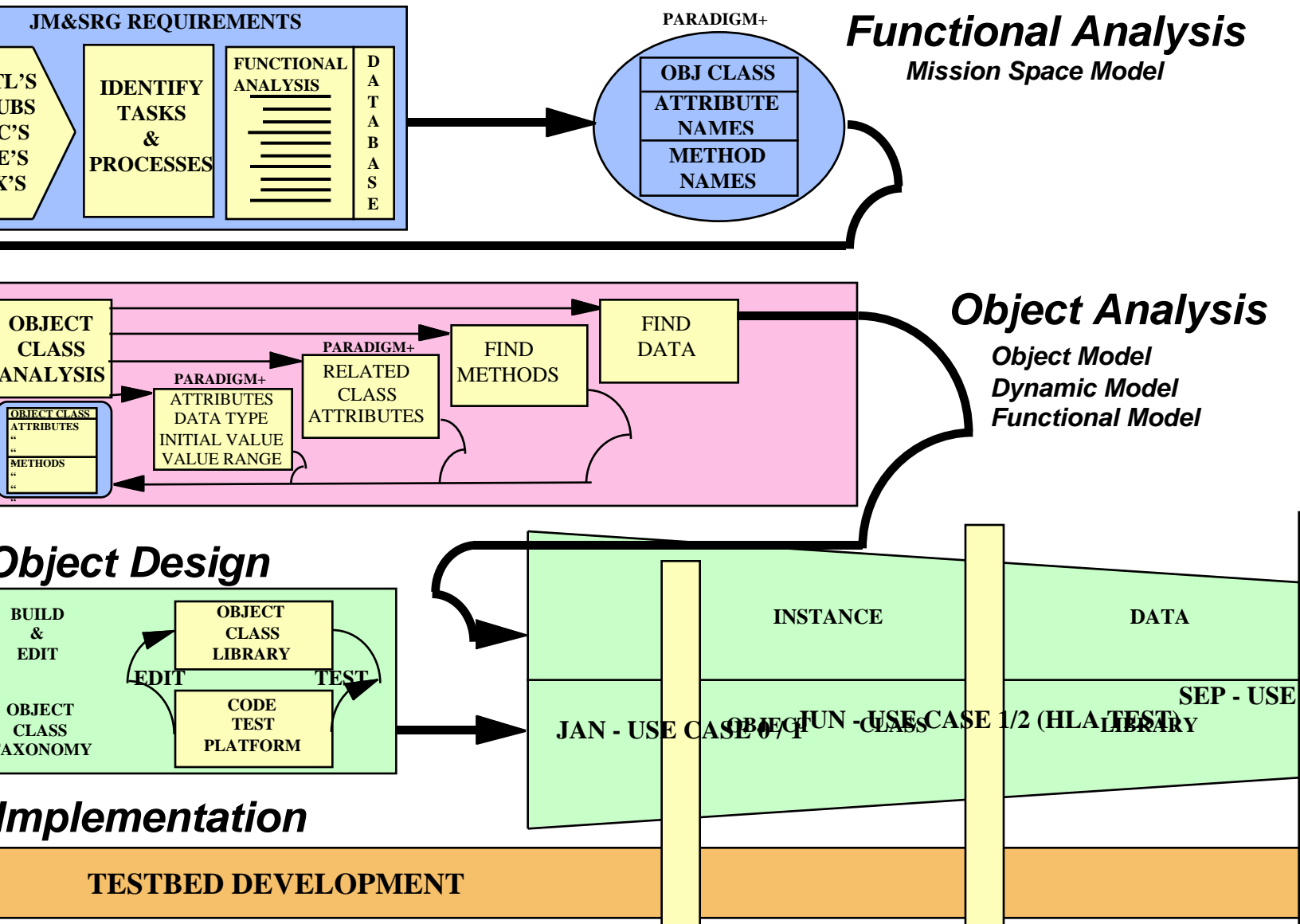
JWARS USE CASE 3

JWARS



SUMMARY DESCRIPTION OF APPROACH

PHASES



JWARS ACTIVITY FLOW DIAGRAM

JWARS

